

## INFLUENCE OF ENTREPRENEURSHIP AND MANAGEMENT ON SOW FARM LABOUR PRODUCTIVITY

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### SUMMARY:

Labour is, next to arable land and capital, one of the three pillars in agricultural production. On Western European sow farms, labour costs, make up 15% to 20% of the piglet production costs. In practice, however, there's a large variation in the number of sows a farmer can handle and in the piglet productivity on the farm. Consequently, the labour costs per piglet raised differ enormously between farms. Apart from obvious factors like farm size, there is little knowledge available about the factors that have an important influence on labour productivity. This is particularly the case for factors concerning management and entrepreneurship. Therefore, a study was carried out to determine the variation in labour productivity among Dutch sow farms and subsequently identify managerial and entrepreneurial factors which influence labour productivity.

A telephone survey among 326 Dutch sow farmers was performed with questions about labour input, production system, technical parameters, management and entrepreneurship. From this survey it appeared that the average labour productivity was 1.74 raised piglets per deployed hour, with a standard deviation of 0.75. Furthermore, using multiple regression models, it was determined that larger sow farms realize a higher labour productivity. The factor Farm Size explained one third of the variation in labour productivity. Notable other significant factors were:

1. An entrepreneur and successor working on the same farm reduces labour productivity. When a successor starts working on the farm the labour demand, for example number of sows, is not proportionally increased, while the labour supply does. Other explanations might be that the entrepreneur is teaching the successor the necessary skills, or both are making plans for the future, which costs extra time.
2. Entrepreneurs who also have a job elsewhere realize a higher labour productivity. This may indicate that these entrepreneurs realize sufficient results in the time they can spend on their farm.
3. Entrepreneurs with the goal 'more spare time for social life' realize a lower labour productivity compared to entrepreneurs who focus on sow production or financial gain. Cause and consequence are unclear. They tend to produce fewer piglets in more time and the entrepreneurs themselves work on average almost nine hours more per week. Therefore it is understandable that they like to have some more spare time for their hobby or family.
4. Entrepreneurs who spend relatively a lot of time gaining expert knowledge realize a higher labour productivity. They probably implement the gained knowledge on their farm and increase the labour productivity.

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## INTRODUCTION

Labour is, next to arable land and capital, one of the three pillars in agricultural production. On Western European sow farms, on average labour costs make up 15% to 20% of the piglet production costs. In practice, however, there's a large variation in the number of sows a farmer can handle and in the piglet productivity on the farm. Consequently, the labour costs per piglet raised differ enormously between farms. Next to the fact that labour is costly in Western Europe, there is another reason why labour productivity receives more and more attention. Sow farms are gradually growing and on a large number of farms the available family labour becomes limited. Hiring external labour is for a lot of entrepreneurs a big step and instead they want to seek ways to optimise labour productivity first. In order to do so, they must know what factors on their farm they can focus. However, apart from obvious factors like farm size, there is very little knowledge available about the factors which have an important influence on labour productivity. This is particularly the case for factors concerning management and entrepreneurship. Therefore, a research was carried out to determine the variation in labour productivity among Dutch sow farms and subsequently identify factors which influence labour productivity, with a special focus on managerial and entrepreneurial factors.

Before we could start with the research, labour productivity had to be defined. We defined labour productivity as the number of raised piglets per deployed hour. This can be calculated by multiplying the raised piglets per sow per year by the average number of sows on the farm and subsequently divide this total raised piglet by the total deployed hours (of all the people who work on the farm).

## MATERIAL & METHODS

In April 2004, a telephone survey among 326 sow farmers was performed. The selected farms were regular farms (e.g. no organic farms) and had at least 100 producing sows at the farm. The entrepreneur was questioned about the following topics:

- General questions about the entrepreneur and his farm (age, family, other agriculture activities next to the sow farm, etc.)
- Farming system (feeding and housing system, number of units, number of weaned piglets per pen, etc.)
- Technical parameters (weaned piglets per sow per year, mortality, etc.)
- Labour input on the farm (number of hours per week of family members and employees)
- Entrepreneurship and management (goal of farm, daily routine, etc.)

The questions were analysed for correlation between labour productivity and the several farm factors, using several multivariate analysis techniques. The final model was a multiple regression model.

To determine the reason behind the relationship between labour productivity and the several farm, management and entrepreneur factors, a more thorough survey was conducted during 96 farm visits. The entrepreneur was asked questions about the amount of time each specific task on his farm costs, how this task was conducted and who performed this task. This collected data was used to support and explain the relationships found in the telephone survey.

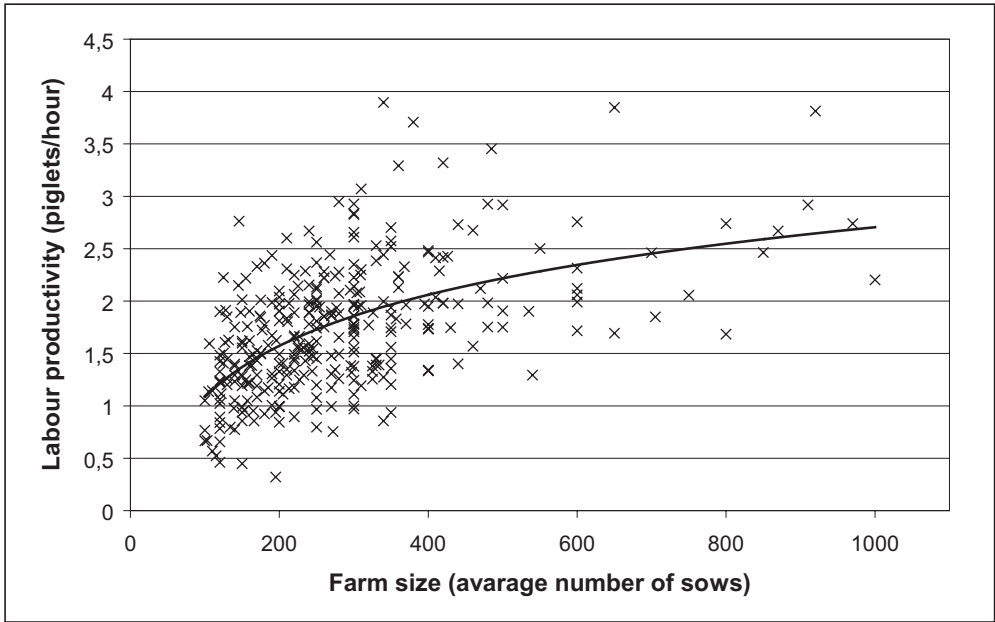
## RESULTS AND DISCUSSION

### Labour productivity

From the survey it appeared that the average labour productivity was 1.74 raised piglets

per deployed hour, with a standard deviation of 0.75. Furthermore, using regression after log-transformation of labour productivity, it was determined that larger sow farms realize a higher labour productivity. This factor explained 34 percent of the variation in labour productivity (Figure 1). The best-fitted trend is a linear relation with LOG(number of sows), indicating that the increase in labour productivity is higher for smaller farms compared to larger farms. However, for both small(er) and large(r) sow farms the variation in labour productivity is considerable (up to 2 piglets per hour). This means that regardless the farm size most farms can improve their labour productivity.

Figure 1: Relationship between farm size and labour productivity.



Of the 326 interviewed farms, the highest 25 realized a labour productivity of 3.03, while the lowest 25 raised 0.78 piglets per deployed hour. The number of average weaned piglets per sow per year was 24.6 and 24.1 for the highest and lowest farms respectively. This indicates that the labour productivity depends mainly on the deployed hours on a farm and to a much lesser extend on the performance of sows. This may be explained by the fact that entrepreneurs have always strived for maximization of sow production and paid less attention to the amount of time this costs.

The variation in labour productivity could only be explained for about 7% by the so-called 'hardware' components on a farm (farm size, housing system and feeding system of the sows and group size of the weaned piglets). The farm logistics is also a hardware component, but is difficult to determine and therefore not included in these analyses. Still, the amount of variation explained by factors other than hardware components is large. This indicates that factors like farm management, working methods of the farmer, etc. are far more important than the farm hardware. These are all factors, which depend on the farmer's management skills and entrepreneurship.

Successor

On 46 of the farms in this survey there was a family member known to take over the sow



farm in the coming years (successor).

On farms with a successor, the labour productivity was lower compared to farms without a successor (Table 1). Whether the successor was or was not in partnership with the entrepreneur had no influence on this labour productivity. Farms without successor tend to produce more piglets in less time compared to farms with a successor. If the successor was in partnership the relative time spent on the farm by the entrepreneur was much lower compared to farms with the successor not in partnership. The children (mainly the successor) compensated a part of this time. But surprisingly, also the partner of the entrepreneur spent more time on the farm when the successor was in partnership. The reason for this difference is still unknown.

Table 1: Influence of a successor on labour productivity

	Successor, in partnership	Successor, not in partnership	No successor <sup>1</sup>
Number of farms	23	23	280
Farm size (number of sows)	311	262	275
Labour productivity	1.37 <sup>a</sup>	1.44 <sup>a</sup>	1.66 <sup>b</sup>
Hours per 100 sows per week	37.6	37.0	28.8
Raised piglets/sow/year	23.0	23.3	23.7
Labour time entrepreneur (%)	45	63	72
Labour time partner (%)	25	15	1
Labour time children (%)	25	15	16
Labour time other (%)	5	7	11

<sup>1</sup> No successor or not (yet) known by the entrepreneur

<sup>a,b</sup> Averages with a different letter within a row significantly differ ( $P < 0.05$ )

The lower labour productivity on farms with a successor is probably explained by especially two factors:

(1) When a successor starts working on the farm the labour demand, for example number of sows, is not proportionally increased, while the labour supply does. This will result in a lower labour productivity.

(2) Passing him the necessary skills and also often plans are made for the future (expansion). This extra time does not directly lead to higher sow productivity and therefore the labour productivity will decrease.

#### Outdoor paid function

The entrepreneurs were asked if they had paid employment elsewhere (another job or a paid position on a board) and how many hours per week.

Entrepreneurs who have paid employment elsewhere for more than 10 hours per week realized a higher labour productivity compared to entrepreneurs who either don't have paid employment elsewhere or for less than 10 hours a week. Labour productivity of the latter is comparable to entrepreneurs who don't have paid employment elsewhere. The time entrepreneurs work at another job elsewhere can also be seen in the relative labour time spent on the farm, which decreased when the entrepreneur spends more time elsewhere. It is mainly the partner who compensates for the outdoor hours of the entrepreneur.

The reason why entrepreneurs with paid employment elsewhere for more than 10 hours per

Table 2: Effect of paid labour outdoors on labour productivity.

Hours paid labour outdoors	0	1 - 10	> 10
Number of farms	280	27	19
Farm size (number of sows)	282	257	232
Average hours paid labour outdoors	0	4.1	23.9
Labour productivity	1.60 <sup>a</sup>	1.65 <sup>a</sup>	1.94 <sup>b</sup>
Hours per 100 sows per week	29.9	29.4	32.4
Raised piglets/sow/year	23.6	23.6	23.4
Labour time entrepreneur (%)	71	64	58
Labour time partner (%)	15	20	27
Labour time children (%)	4	5	2
Labour time other (%)	10	11	13

<sup>a,b</sup> Averages with a different letter within a row significantly differ (P < 0.05)

week realize a higher labour productivity is not totally clear. It may indicate that these entrepreneurs realize sufficient results/performance in the time they can spend on their farm.

Goal of farm

The entrepreneur was asked for his main goal of entrepreneurship on the farm. The opportunities he could choose from were mainly focused on maximizing the technical or economical output. Two other goals were optimising labour efficiency on the farm and spending more time for social life (family, hobbies, etc.).

Table 3: The influence of having 'more spare time for social life' as main goal of the entrepreneur.

More spare time for social life as main goal of entrepreneur	Yes	No
Number of farms	9	317
Farm size (number of sows)	273	277
Labour productivity	1.39 <sup>a</sup>	1.63 <sup>b</sup>
Hours per 100 sows per week	36.0	29.8
Raised piglets/sow/year	22.9	23.6

<sup>a,b</sup> Averages with a different letter within a row significantly differ (P < 0.05)

Entrepreneurs with the goal 'more spare time for social life' realized a lower labour productivity compared to entrepreneurs who focus on sow production or financial gain (Table 3). The time per 100 sows tended to be higher and in this time they realized fewer piglets per sow per year. The entrepreneurs self worked on average almost 57 hours per week against 48 hours for the total group. Therefore it is understandable that they like to have some more spare time for their hobby or family.

Gaining expert knowledge

The time spent on gaining expert knowledge contains the time spent on reading specialist journals, discussion with advisors and veterinarians, meetings, discussion clubs, etc.

Entrepreneurs who spent relatively more time on gaining expert knowledge realize a higher labour productivity. Sow production did not seem to differ between the three groups, but farms



Table 4: Influence of percentage of labour time spent on gaining expert knowledge on labour productivity.

Percentage of labour time spent on gaining expert knowledge	0-5	5-8	> 8
Number of farms	119	106	101
Farm size (number of sows)	307	272	246
Average hours paid labour outdoors	4.5	6.4	11.3
Labour productivity	1.53 <sup>a</sup>	1.60 <sup>a</sup>	1.81 <sup>b</sup>
Hours per 100 sows per week	32.2	29.9	27.5
Raised piglets/sow/year	23.6	23.7	23.5

<sup>a,b</sup> Averages with a different letter within a row significantly differ ( $P < 0.05$ )

that spend relatively more time on gaining expert knowledge tended to produce these piglets in less time. They probably implement the gained expert knowledge on their farm and with that increase the labour efficiency.

## CONCLUSIONS

1. Farm size has an important influence on labour productivity. Larger farms realize a higher labour productivity. But within the group farms of comparable farm size, the variation in labour productivity is still considerable (up to 2 piglets per hour).
2. Farm management factors and structural working by the farmer are of far more influence compared to the hardware components (e.g. housing and feeding system).
3. Farms with a successor should pay extra attention to their labour productivity and find the right balance between labour supply and demand during the succession period.
4. Entrepreneur factors like goal of farm, paid function outside the farm and also how much time is spent on gaining knowledge have a significant impact on the labour productivity.